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10/525,249	08/08/2005	Mitsushi Itano	Q86398	5360

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SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

WEBB, GREGORY E

ART UNIT	PAPER NUMBER
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1796

NOTIFICATION DATE	DELIVERY MODE
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02/01/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

sughrue@sughrue.com
PPROCESSING@SUGHRUE.COM
USPTO@SUGHRUE.COM

Office Action Summary	Application No. 10/525,249	Applicant(s) ITANO ET AL.	
	Examiner Gregory E. Webb	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-12,14-42,44,45 and 47-67 is/are pending in the application.
- 4a) Of the above claim(s) 15-34 and 67 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-12,14,35-42,44,45,47-66 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12/8/2009 have been fully considered but they are not wholly persuasive.
2. The applicant's arguments are persuasive concerning the Suzuki et al ('352) reference and the Tanabe et al '976 reference. In both references a compound is required that is excluded by the transitional phrase "consisting of."
3. The applicant make a similar argument with respect to the Tanabe '063 reference. In particular the applicant argues that the non-metal base is required in the composition but excluded by the transitional phrase. The examiner disagrees in this case because the non-metal base is in fact an organic solvent.
4. For example Tanabe teaches the following with respect to the metal-free base:

The composition of the present invention has an almost neutral pH value of 5 to 8. This pH range may be attained by using component (a) which is almost neutral. The proportion of hydrofluoric acid to a metal-free base to be added thereto so as to attain a neutral pH value varies depending on the kind of the base, and cannot hence be shown unconditionally. For example, in the case of ammonia water, component (a) having a pH value in the desired range can be prepared by mixing hydrofluoric acid with ammonia water having the same molar concentration in a proportion of 1/1 by volume. In the case of ethanolamine, component (a) having a pH value in the desired range can be prepared by mixing

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1,000 ml of 1 mol/l hydrofluoric acid with 1 mol of monoethanolamine. Use of component (a) having a pH value in the above-specified range enables the composition of the present invention to be handled safely while maintaining the removability of modified films and inhibiting the composition from corroding a metal film on a substrate or peripheral devices including a remover feeder. Furthermore, a low hydrogen fluoride content of component (a) eliminates the necessity of troublesome exhaust and wastewater treatments, which are necessary in resist removing processes where hydrogen fluoride generates.

5. In this case monoethanolamine is used as the metal-free base.

Monoethanolamine is a viscous colourless liquid with ammonia odor and is a common organic solvent found in a variety of cleaning products including wax stripper, liquid laundry detergents, and liquid dishwashing. Monoethanolamine behaves similarly to ammonia but does not contain the strong offensive smell. It should also be noted that the applicant allows for any number of additional solvents in the instant claims.

6. In support for the argument that monoethanolamine is a solvent the examiner looks to Bingham (US 5096610) where it is clearly taught monoethanolamine is a solvent and is equivalent to those solvent claimed by applicant:

1. A floor finish remover composition comprising effective amounts of (a) a solvent selected from diethylamine, diethanolamine, monoethanolamine, ethylene glycol monobutyl ether, ethylene glycol phenyl ether, and mixtures thereof, (b) water, (c) a metasilicate and (d) a linear, 6-10 carbon, organic compound selected from caprylic acid, n-octane sulfonate, caproic acid, decylenic acid, and their alkali salts.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

8. Claims 1-6, 8-12, 14, 35-42, 44, 45, and 47-66 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanabe et al (US 5,905,063).

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Concerning the compounds of claim 21, claimed intended use, hydrogen fluoride, Tanabe, Masahito teaches the following:

The composition of the present invention has an almost neutral pH value of 5 to 8. This pH range may be attained by using component (a) which is almost neutral. The proportion of hydrofluoric acid to a metal-free base to be added thereto so as to attain a neutral pH value varies depending on the kind of the base, and cannot hence be shown unconditionally. For example, in the case of ammonia water, component (a) having a pH value in the desired range can be prepared by mixing hydrofluoric acid with ammonia water having the same molar concentration in a proportion of 1/1 by volume. In the case of ethanolamine, component (a) having a pH value in the desired range can be prepared by mixing **1,000 ml of 1 mol/l hydrofluoric acid with 1 mol of monoethanolamine**. Use of component (a) having a pH value in the above-specified range enables the composition of the present invention to be handled safely while maintaining the removability of modified films and inhibiting the composition from corroding a metal film on a substrate or peripheral devices including a remover feeder. Furthermore, a low hydrogen fluoride content of component (a) eliminates the necessity of troublesome exhaust and wastewater treatments, which are necessary in resist removing processes where hydrogen fluoride generates.

Concerning the preferred esters, preferred nitrogen compounds, preferred glycol ethers, preferred amides, and preferred solvent types, Tanabe, Masahito teaches the following:

Any organic solvent may be used as component (b) in the present invention, as long as it is miscible with components (a), (c), and (d). Water-soluble organic solvents used in conventional organic amine-based remover solution compositions may be used.

Examples of the water-soluble organic solvents include sulfoxides (e.g., dimethyl sulfoxide), sulfones (e.g., dimethyl sulfone, diethyl sulfone, bis(2-hydroxyethyl) sulfone, tetramethylene sulfone), **amides** (e.g., **N,N-dimethylformamide**, **N-methylformamide**, **N,N-dimethylacetamide**, **N-methylacetamide**, N,N-diethylacetamide), lactams (e.g., **N-methyl-2-pyrrolidone**, N-ethyl-2-pyrrolidone, N-propyl-2-pyrrolidone, N-hydroxymethyl-2-pyrrolidone, N-hydroxyethyl-2-pyrrolidone), imidazolidinones (e.g., 1,3-dimethyl-2-imidazolidinone, 1,3-diethyl-2-imidazolidinone, 1,3-diisopropyl-2-imidazolidinone), lactones (e.g., **.gamma.-butyrolactone**, .delta.-valerolactone), and polyhydric alcohols (e.g., **ethylene glycol**, **ethylene glycol** inonomethyl ether, **ethylene glycol monoethyl ether**, **ethylene glycol** monobutyl ether, **ethylene glycol**, monomethyl ether acetate, **ethylene glycol monoethyl ether** acetate, diethylene glycol, **diethylene glycol monomethyl ether**, **diethylene glycol monoethyl ether**, diethylene glycol monobutyl ether); and derivatives thereof. Among these, preferred are dimethyl sulfoxide, **N,N-dimethylformamide**, **N,N-dimethylacetamide**, **N-methyl-2-pyrrolidone**, 1,3-dimethyl-2-imidazolidinone, ethylene glycol, and **diethylene glycol** monobutyl ether, because these solvents bring about the removability of modified resist films. In particular, use of a water-soluble organic solvent comprising at least 10% by weight (wt %) **ethylene glycol** as component (b) is preferred in that the composition of

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the present invention containing this component (b) is highly inhibited from corroding a metal deposition substrate in the removing of a holed resist pattern. In this case, **ethylene glycol** alone may be used as component (b) because the higher the **ethylene glycol** content, the higher the anticorrosive effect. A mixture of 40 to 60 wt % of **ethylene glycol** and 60 to 40 wt % of dimethyl sulfoxide is also advantageous.

Concerning the preferred polyols, Tanabe, Masahito teaches the following:

Claims What is claimed is: 1. A remover solution composition for resist wherein said remover solution for resist has a pH of 5 to 8 and comprises the following components: (a) 0.2 to 8% by weight of a salt of **hydrofluoric acid** with a metal-free base, (b) 30 to 90%; by weight of a water-soluble organic solvent comprising at least one solvent selected from the group consisting of dimethyl sulfoxide, 1,3-dimethyl-2-imidazolidinone, and **diethylene glycol monobutyl ether**, and the balance being (c) water.

Concerning the preferred hydrocarbons, preferred monocarboxylic acid, and preferred polycarboxylic acid, Tanabe, Masahito teaches the following:

Examples of the carboxyl group-containing organic compounds and anhydrides thereof include formic acid, **acetic acid**, **propionic acid**, **butyric acid**, **isobutyric acid**, **oxalic acid**, malonic acid, **succinic acid**, glutaric acid, maleic acid, fumaric acid, benzoic acid, phthalic acid, 1,2,3-**benzenetricarboxylic acid**, **glycolic acid**, **lactic acid**, malic acid,

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citric acid, acetic anhydride, phthalic anhydride, maleic anhydride, succinic anhydride, and salicylic acid. Among these, preferred are formic acid, phthalic acid, benzoic acid, phthalic anhydride, and salicylic acid, and especially preferred are phthalic acid, phthalic anhydride, and salicylic acid.

Concerning the preferred sulfonic acid, Tanabe, Masahito teaches the following:

Conventionally used resist remover solutions for removing resist include organic sulfonic acid-based remover solutions containing an **alkylbenzenesulfonic acid** as an essential component and organic amine-based remover solutions containing an organic amine, e.g., monoethanolamine, as an essential component. However, the organic sulfonic acid-based remover solutions have a drawback that since they contain a highly toxic organic solvent, such as a phenol compound or chlorobenzene, not only use of the remover solutions results in poor working efficiency and poses an environmental problem, but also the remover solutions are apt to corrode electroconductive metal films on substrates and the like. In contrast, the organic amine-based remover solutions are less toxic than the organic sulfonic acid-based remover solutions, do not require a troublesome wastewater treatment of the organic sulfonic acid-based remover solutions, are effective in removing modified films resulting from treatments such as dry etching, ashing, ion implantation, and the like, and are highly inhibited from corroding substrates having provided thereon Al, Cu, and the like. Because of these advantages, the organic amine-based remover solutions are currently used extensively.

9. Claims 1-6, 8-12, 14, 35-42, 44, 45, and 47-66 are rejected under 35 U.S.C. 102(b) as being anticipated by Suyama, Makoto (US 20060178282).

Concerning the hydrogen fluoride, Suyama, Makoto teaches the combination of the hydrofluoric acid with a variety of compounds including organic amine based solvents (see claim 1 and claim 8):

1. A method for producing an etching or cleaning solution comprising (1) at least one member selected from the group consisting of fluoride salts and bifluoride salts formed from at least one member selected from the group consisting of ammonia, hydroxylamines, aliphatic amines, aromatic amines, aliphatic quaternary ammoniums and aromatic quaternary ammoniums with hydrofluoric acid; (2) at least one heteroatom-containing organic solvent; and (3) water, the method comprising the steps of: Step 1: mixing an aqueous hydrofluoric acid solution with at least one heteroatom-containing organic solvent, and Step 2: mixing the mixture obtained in Step 1 with at least one member selected from the group consisting of ammonia, hydroxylamines, aliphatic amines, aromatic amines, aliphatic quaternary ammoniums, aromatic quaternary ammoniums, and fluorides thereof.

8. The method according to claim 1, wherein the product solution comprises the at least one member selected from the group consisting of ammonium bifluoride,

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monoethanolamine bifluoride, and ethylamine bifluoride in a proportion of 0.001 to 5 mass. %; the at least one heteroatom-containing organic solvent selected from the group consisting of ethanol, isopropanol (IPA), and acetone in a proportion of 92 to 99.9989 mass. %; and water in a proportion of 0.0001 to 3 mass. %.

Concerning the preferred fluorinated alcohols, preferred hydrocarbons, preferred polyols, preferred ketones, preferred ethers, preferred monocarboxylic acid, preferred amides, preferred sulfonic acid, preferred nitrogen compounds, preferred polycarboxylic acid, preferred aldehydes, preferred monohydric alcohols, preferred glycol ethers, preferred solvent types, and preferred nitriles, Suyama, Makoto teaches the following:

[0042] Examples of heteroatom-containing organic solvents usable in the composition of the invention are **N,N-dimethylformamide**, **N,N-dimethylacetamide**, dimethylsulfoxide, **N-methyl-2-pyrrolidone**, 1,3-dimethyl-2-imidazolidinone; **methanol**, **ethanol**, **isopropanol (IPA)**, **1-propanol**, **1-butanol**, **2-butanol**, **t-butanol**, 2-methyl-1-propanol, **1-pentanol**, **1-hexanol**, **1-heptanol**, **4-heptanol**, **1-octanol**, 1-nonanol, **1-decanol**, **1-dodecanol**, and like alcohols; **ethylene glycol**, **1,2-propanediol**, **propylene glycol**, **2,3-butanediol**, glycerol, and like **polyols**; **acetone**, **acetylacetone**, **methyl ethyl ketone**, 1,3-dihydroxyacetone, and like **ketones**; **acetonitrile**, **propionitrile**, **butyronitrile**, **isobutyronitrile**, **benzonitrile**, and like **nitriles**; **formaldehyde**, **acetaldehyde**, **propionaldehyde**, and like **aldehydes**; **ethylene**

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glycol monomethyl ether, ethylene glycol monoethyl ether, diethylene glycol monobutyl ether, and like alkylene glycol monoalkyl ethers; tetrahydrofuran, dioxane, and like cyclic ethers; trifluoroethanol, pentafluoropropanol, 2,2,3,3-tetrafluoropropanol, and like fluoroalcohols; 1,1,2,2-tetrafluoro-1-(2,2,2-trifluoroethoxy)ethane, and like hydrofluoroethers; acetic acid, propionic acid, butyric acid, isobutyric acid, valeric acid, caproic acid, caprylic acid, monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monofluoroacetic acid, difluoroacetic acid, trifluoroacetic acid, .alpha.-chlorobutyric acid, .delta.-chlorobutyric acid, .gamma.-chlorobutyric acid, lactic acid, glycolic acid, pyruvic acid, glyoxalic acid, acrylic acid, and like monocarboxylic acids; methanesulfonic acid, toluenesulfonic acid, and like sulfonic acids; oxalic acid, succinic acid, adipic acid, tartaric acid, citric acid, and like polycarboxylic acids; sulfolane; and nitromethane. Particularly preferable are alcohols, monocarboxylic acids, **ketones, and like oxygen-containing organic solvents. Specific examples thereof are **methanol, ethanol, n-propanol, isopropanol (IPA)**, and like alcohols; **acetone, methyl ethyl ketone, 1,3-dihydroxyacetone, and like ketones**; and **acetic acid, propionic acid**, and like monocarboxylic acids. Such heteroatom-containing organic solvents can be used singly or as a combination of two or more types.**

10. Claims 1-6, 8-12, 14, 35-42, 44, 45, and 47-66 are rejected under 35 U.S.C. 102(b) as being anticipated by Itano et al (US 2005/0003977).

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Concerning the preferred monocarboxylic acid, Itano, Mitsushi teaches the following:

[0045] The composition of the invention may further contain (5) an anticorrosive agent. Examples of anticorrosive agents include catechol, pyrogallol, oxine and like aromatic hydroxy compounds; benzotriazole, tolyltriazole and like triazole compounds and their derivatives; phthalic acid, salicylic acid, azelaic acid and like carboxyl-containing organic compounds, ethylenediaminetetra**acetic acid** and like aminopolycarboxylic acids, 1,2-propanaminetetramethylene phosphonic acid and like phosphonic acids; cupferron and like chelating agents; pyridine derivatives, sodium 2-mercaptobenzothiazole and like thiazole compounds; tetramethylammonium formates and like quaternary ammonium salts; sorbitol, arabitol, aryllose and like saccharides and their derivatives. The amount of anticorrosive agent is not limited as long as the desired effects of the invention can be achieved; it is, however, generally about 0.01-30 mass % and preferably about 0.5-10 mass %.

Concerning the preferred fluorinated alcohols, preferred polyols, preferred ketones, preferred ethers, preferred amides, preferred nitrogen compounds, preferred glycol ethers, preferred aldehydes, preferred solvent types, and preferred nitriles, Itano, Mitsushi teaches the following:

6. A cleaning composition according to claim 1, wherein the organic solvent including one or more heteroatoms is at least one member selected from the group consisting of

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N,N-dimethylformamide, N,N-dimethylacetamide, dimethylsulfoxide, **N-methyl-2-pyrrolidone**, 1,3-dimethyl-2-imidazolidinone; **methanol, ethanol, isopropyl alcohol (IPA), 1-propanol, 1-butanol, 2-butanol, t-butanol, 2-methyl-1-propanol, 1-pentanol, 1-hexanol, 1-heptanol, 4-heptanol, 1-octanol, 1-nonyl alcohol, 1-decanol, 1-dodecanol** and like alcohols; **ethylene glycol, 1,2-propanediol, propylene glycol, 2,3-butanediol**, glycerol and like **polyols**; **acetone, acetylacetone, methyl ethyl ketone** and like **ketones**; **acetonitrile, propionitrile, butyronitrile, isobutyronitrile, benzonitrile** and like **nitriles**; **formaldehyde, acetaldehyde, propionaldehyde** and like **aldehydes**; **ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, diethylene glycol monobutyl ether** and like **alkylene glycol monoalkyl ethers**; **tetrahydrofuran, dioxane** and like cyclic **ethers**; **trifluoroethanol, pentafluoropropanol, 2,2,3,3-tetrafluoropropanol** and like **fluorinated alcohols**; sulfolane and nitromethane.

Concerning the compounds of claim 21, and hydrogen fluoride, Itano, Mitsushi teaches the following:

[0011] The at least one member selected from the group consisting of hydroxylamines, aliphatic **amines**, aromatic **amines**, aliphatic quaternary ammonium salts and aromatic quaternary ammonium salts that is contained in the cleaning composition of the invention can form a salt with **hydrofluoric acid**.

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Concerning the preferred monohydric alcohols, Itano, Mitsushi teaches the following:

9. A cleaning composition according to claim 7, wherein the oxygen-containing organic solvent is at least one member selected from the group consisting of **isopropyl alcohol**, **ethanol** and **methanol**, and the concentration of water is 10 mass % or less.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory E. Webb whose telephone number is 571-272-1325. The examiner can normally be reached on 9:00-17:30 (m-f).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon can be reached on 571-272-1498. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Gregory E. Webb/
Primary Examiner, Art Unit 1796

Gregory E. Webb
Primary Examiner
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